



Greening the Cities

Who knew? Milwaukee is a tree-hugger’s paradise, providing a national model for a growing urban forestry movement.

BY KATHERINE ESPOSITO

This Milwaukee municipal nursery cultivates maple trees and many other trees and plants for city use.

Photos by Katherine Esposito

IF ONLY EVERY STREET TREE could put its roots down in Milwaukee. In this tidy city on the Lake Michigan shore, the romance of sumptuous shade was long ago married with the hard-nosed science of how to create it. Proper tree care is not a happy accident in Milwaukee—not with “tree police” like Jim Kringer on the case.

Last summer, in a plainclothes neighborhood on the city’s North Side, on a street half-demolished due to a major reconstruction, Kringer eyeballed a particular midsized maple. One large root, critical for tree support, had been severed by the road contractor. It was accidental, but in Milwaukee, there are no excuses. There are only fines. The penalty was already up to \$760, Kringer said, and that didn’t count staff time to make repairs. Not long ago, one damaged tree cost a company a whopping \$7,000.

After so many years, Kringer, who started working as an arborist in 1979 and created the job of “urban forestry inspector” two years later, has become a respected, if not necessarily revered, presence on Milwaukee road construction sites. “On one job, a branch fell from a tree as I was walking around the corner,” says Kringer. “The contractor said, ‘One of these days I’m gonna have the bill in my hand before the branch hits the ground.’” He laughs. Long ago, such stringent policies caused a mini-revolution in contractors’ attitudes toward Milwaukee’s “urban

forest.” At one time, the city annually lost up to 400 street trees due to construction damage. After city forestry laws gained some teeth, starting in 1981, losses were pared to only a handful a year. Add irrigation and expert pruning to the recipe, and those trees that remain live to an average age of 62 years—twice the national average.

Tree professionals have always sensed in their gut that there were sound economic reasons, not just aesthetic ones, to grow trees big. But it took new, sophisticated computer models, combined with knowledge of basic tree biology, to find them. Researchers at the U.S. Forest Service have now documented the monetary worth of trees in terms of cooling power, air cleansing, and rainfall interception. Meanwhile, in Milwaukee the values of homes located directly on streets with landscaped boulevards are higher as well. A 2000 study found that they were worth about \$1,600 more than those farther away, despite greater levels of traffic.

When considered along with hundreds of iridescent flowers and shrubs planted on grassy city boulevards, all grown at a 160-acre city-owned nursery just outside the city limits, Milwaukee’s \$11 million urban forestry program has engendered a strong sense of civic pride. It’s not just local pride, either: when asked what they think of Milwaukee’s efforts, foresters across the nation all but glow. But, due to a combination of factors, including lack of public understanding, scant political support, and tight city budgets, it isn’t often emulated.

Foresters enter their profession because they love trees. They love the silhouettes they make, their steadfast reliability, the rustling sounds of their leaves. But many trees don’t live in the country. They’re in towns, along roads, in backyards, in parks, in medians. They grow by accident, but often they are planted for a reason. Either way, one strategically located urban tree frequently has more direct human impact, in terms of its effect on our personal and physical well-being, than one found amid 40 others. You’d think we’d treat

them as more special. More often, we take them for granted.

Last spring, two old blocks of cracked cement street near my house in Madison were torn up, sidewalk to sidewalk and three feet down. It was a scheduled reconstruction, and for two months, the road was a mess of rubble and machinery. What caught my eye, though, was a different kind of mess: the mangled, desiccated roots of a number of stately terrace trees. The largest, a silver maple a good 30 inches in diameter, was an embarrassment to see.

This clearly wasn’t Milwaukee. I called our city forestry office to ask for an opinion. I spoke with one of two forestry specialists in the city whose main duty

is fielding citizen calls rather than inspecting street projects. He was dismayed as well.

By then, it was too late. All that remained was to backfill the roots and hope for the best. Hope that enough sturdy stabilizer roots remained to prevent catastrophe if the neighborhood got struck by a storm. Hope that the maple wouldn’t enter a long, steady period of decline. We both knew that damage had occurred, but no one else ever would.

In 1995, helped by a grant from the state Department of Natural Resources, Milwaukee city foresters published a definitive manual on how to prevent construction damage to city trees.



Kringer on the case: Jim Kringer pioneered the job of “urban forestry inspector” and is a respected figure at Milwaukee road construction sites.

Kringer even developed a short seminar on the topic, now mushroomed to seven hours, that he takes to cities as close as Madison and as far away as Las Vegas. The day I met him, he had already personally inspected 180 street trees on that North Side site and was preparing to drive to another one.

He told me a story. Years ago, he said, an East Side Milwaukee homeowner had sued a private contractor for \$100,000 after the firm had unnecessarily chopped down a majestic elm obstructing its reconstruction plans. It was the shade she'd lost, the depreciation suffered by her home, the beauty of that lovely tree. "She didn't want the money," Kringer says. "She wanted the contractor to go in the woods and get a 22-inch elm to put in front of the house." It didn't happen, of course, but she'd made her point.

Today, when a road project is planned, city engineers and private contractors call Kringer first. They know they'll have hell—or at least a chunk of money—to pay if they don't. These days, Kringer says, "the first thing on their mind is trees."

HOW TREES SAVE MONEY

Little did that angry Milwaukee homeowner know that she was in the vanguard of a movement to question the

business-as-usual planning process in city public works departments.

Traditionally, city planners, engineers, private builders, and developers have hashed out their goals and ideas behind all-but-closed doors, designing new subdivisions, rebuilding old streets, and constructing new shopping centers. At the end of the process, a color blueprint is produced showing streets, sidewalks, buildings, and an assemblage of perfectly round green trees overlaying it all. Without the trees sketched in, the drawing would resemble a pallid skeleton. In real life, however, that's exactly what they often turn out to be.

Dr. Gregory McPherson, a research forester with the USDA Forest Service's Center for Urban Forest Research in Davis, California, finds those outcomes somewhat perverse. "It's real clear when you look at drawings how important the trees are," he said in a telephone interview. "But the realistic success of those trees depends on a lot more things than how well they're drawn by the landscape architect in the picture."

Two decades ago, McPherson began to investigate just how valuable urban trees could be. Everyone loves trees and wants them, he knew, but few cities except Milwaukee were willing to put the money and effort into ensuring that they survive. What if he could show scientifically that trees have economic ben-

efits, too? A tunnel of trees over houses on a scalding August day is infinitely preferable to that same street naked to the sun and baking like an oven. What if there were a way to prove the savings?

At the University of Wisconsin-Stevens Point, Professor Les Werner, a 1970s pioneer in the discipline of urban forestry, is thinking along similar lines. "This is a personal opinion," says Werner, "but we aren't going to exact a lot of change until we get people to understand that when we start talking about the value of trees, those are real dollars."

Most of that value isn't in the beginning, when a tree is first planted, or at the end, when it is removed. It's in the middle, that long span of years when a tree is finally reaching full size, with a canopy dense and wide enough for its benefits to be felt. And, perhaps, measured.

That's where McPherson's research comes in. With the help of James Simpson, a Forest Service meteorologist, McPherson has tried to calibrate how urban trees cleanse the air and shade buildings. Just as tropical forests are viewed as "carbon sinks," able to store more carbon than they release and thus provide a defense against atmospheric carbon dioxide accumulation, urban trees—assuming they live long enough—can do the same.

In one study published in 2000, the two men used computer models to estimate two things: first, how the location and sizes of trees would lower the energy used by a home due to reduced air conditioning needs; and second, how much carbon would be stored in the tree's wood. Adding those two together resulted in a quantity known as "avoided carbon emissions."

They looked at two cities: Tucson, Arizona, and Boulder City, Nevada. The climate was similar for both cities, but in Tucson, the trees lived longer than in Boulder City and were planted closer to homes. By contrast, in Boulder City many trees were found beyond neighborhoods, in parks and on downtown streets. The results, plotted over 40 years, showed a steady increase in the cooling power of Tucson trees, while the utility of those in Boulder City declined



Mayhem at Maywood: A branch crashing down from an 80-year-old cottonwood in a Monona park prompted city officials to cut down two dozen neighboring trees. A positive upshot: the city hired professional arborists to monitor its trees to prevent such drastic action in the future.

In Your Backyard

after 25 years. Further, after tallying all the benefits, the researchers found that the trees in Tucson provided double the avoided carbon emissions as the trees in Boulder City.

Another computer model can predict how much rain is intercepted by trees, which may prove useful due to stringent new federal prohibitions against stormwater runoff.

But one of McPherson's favorite projects is a field study of the costs and benefits of 10 different tree species growing in Modesto, California. The researchers obtained three years of data showing how much money the city spent to maintain each type of tree and contrasted that with modeled calculations of benefits: energy savings, air quality improvements, carbon storage, decreased stormwater runoff, and increased property values.

The winner? By a mile, it was the London planetree, a relative of the sycamore. "It's a species that grows very quickly, but it's not weak-wooded," notes McPherson. "It requires relatively little pruning, it's very hardy in city conditions, and it grows very large. So the benefits get big as the tree gets big." He calculated that the amount of money saved by the benefits provided by a large London planetree was as much as several hundred dollars annually. Meanwhile, Modesto spent only about 10 dollars yearly to keep it strong.

For urban foresters, the lessons from this and other research are clear: good urban planning isn't only about pouring concrete, designing streets, and reviewing subdivision proposals. If people are serious about softening and improving the concrete jungle by adding shade, texture, and color, they have to start even before a pencil is put to paper.

"Trees are seen as these real resilient features that you can just stick in at the end," McPherson says. "But just the mere presence of a tree doesn't mean as much to me as how well that tree functions, given the particular site it's in."

"That means taking a more functional approach to urban forestry," he continues. "It means we're going to have to plan sooner in the process for trees, and not have them be an afterthought."

Compared with traditional rural forestry, urban forestry is a relatively young animal. While the larger forestry program at the state Department of Natural Resources was started a century ago in response to severe logging practices and subsequent wildfires, the specialized Urban and Community Forestry program began much later, in 1990. Milwaukee's reputation as a leader in urban forestry played a role here as well; the state's longtime urban forest coordinator, Richard Rideout, was previously the forestry technical services coordinator for that city.

The program is advised by the Wisconsin Urban Forestry Council, a statewide committee of 23 citizens and professionals appointed to staggered three-year terms by the State Forester. It is financed by both the state and federal governments and offers a variety of services, including an annual conference in late January cosponsored by the Wisconsin Arborist Association; tree care workshops; technical assistance by four full-time regional urban forestry coordinators to

communities and nonprofit groups; and hundreds of thousands of dollars in matching grants every year to help communities better manage trees.

Milwaukee took advantage of a DNR grant to produce its manual on trees and construction damage, while Monona received one to help pay for its new tree inventory. About 60 to 70 grants are awarded each year.

The Urban Forestry program also administers the Tree City USA awards program for the National Arbor Day Foundation.

If you have any technical tree-related questions, call your municipal forester or parks department. If no one is in charge, consider starting a program yourself.

For more information about the DNR's Urban Forestry program, including grants and links to national sites, see <http://dnr.wi.gov/org/land/Forestry/UF/index.htm>



A \$760 mistake: One large root, critical for tree support, had been severed by a road contractor. It was accidental, but in Milwaukee there are no excuses, only fines.

urban forestry

Until people experience the contrast between truly impressive forestry programs and those that are merely mediocre, they don't know what's missing.

Some communities, such as Milwaukee, figured that out a long time ago.

CREAM CITY IS GREEN CITY

Milwaukee's innovative approach to urban forestry goes back to 1918 with the appointment of Otto W. Spidel as city forester. Even then, tree care was deliberate, with up to 30 field workers laboring to plant, prune, and grow new trees. In the 1950s, the program was bolstered by public dismay over the depredations caused by Dutch elm disease, a fungal disease that was introduced to this continent in 1930s. American elms, loved for their arching beauty and deep shade, had long been the tree of choice

for public streets in towns and cities everywhere, but reliance on one species proved a painful mistake. In Milwaukee alone, 200,000 trees eventually died, creating a desert of stumps and sunburned homes. New street trees were replanted by the thousands, but residential backyards are frequently still as bare as the day the elms came down. In all, the city's "canopy cover" fell to 16 percent, far lower than before the epidemic.

In 1996, that disappointing fact was highlighted by a new type of aerial forest analysis using software called CityGreen, then being pioneered by American Forests, a national nonprofit forest conservation organization. In most cities, including Milwaukee,

American Forests calls for an average canopy coverage of 40 percent, lower in downtowns and higher around homes. That lofty target stimulated the endowment and founding of a nonprofit group, Greening Milwaukee, to boost private tree planting. But according to executive director Joe Wilson, with so many beautiful trees out front, many residents see little need to plant them in back. It's Wilson's job to hand them the research explaining why they should. (More information at www.greeningmilwaukee.org)

Forestry, whether urban or rural, has never found it easy to convince people that purposeful planning is needed for lofty results. After all, there are trees growing nearly everywhere, and it takes a trained eye to spot problems. Until people experience the contrast between truly impressive forestry programs and those that are merely mediocre, they don't know what's missing.

In fact, after describing Milwaukee's urban forestry achievements to friends in my own town, every response was



The happy pruner: Plant caretakers in Milwaukee say they are regularly cheered on and thanked by passersby.

similar: "But I thought we were a Tree City USA! Aren't we just as good?" (Tree City USA is a national awards program to encourage better municipal urban forestry efforts.)

Not today, perhaps. But maybe tomorrow. And, as with Dutch elm disease, it can take a crisis to propel a closer look.

That's what happened this past year in Monona, a leafy suburb of Madison that prizes its trees but never spent much time thinking about them. That all changed this past year, however, after a tired branch from a cottonwood tree, one of about fifty 80-year-old giants in a tiny city park, crashed onto a swing set below. Cottonwoods grow huge, with branches that are themselves the size of many mature trees. The park is north of an elementary school; city officials, fearing disaster should children be playing underneath when the next branch dropped, finally proposed that two dozen be cut down. In late July, they were.

It aroused considerable public controversy, but it led to something positive: better urban forest planning. With the

help of a \$25,000 DNR matching grant, the city decided to hire professional arborists from Wachtel Tree Science & Service of Merton to examine the rest of its public trees and place all the information on a computerized map. Such mapping, known as Geographic Information Systems, or GIS, is becoming more common in public works and engineering departments. It allows city workers to quickly pinpoint the location of sewer and water lines, street signs, and fire hydrants. And, now, street trees as well.

It's a modern version of the urban ecosystem analysis that Milwaukee received in 1996. And, just as that analysis propelled Milwaukee's forestry program to ambitious new goals, Monona city administrator David Berner, freshly emerged from the public tumult over cutting cottonwoods, is hopeful that Monona's will, too.

In Milwaukee, such battles were fought—and largely won—a long time ago.

Last summer on a rainy July day, I cruised Milwaukee's streets with Jeff

Boeder, the city's north district forestry supervisor. Suddenly, instead of the usual city boulevards filled with neat turf, full trees, and gay beds of flowers, I noticed medians filled only with unkempt dandelions and leggy grass. We'd just driven past the city limits, Boeder explained. Here was a community where forestry was a much lower priority.

It's a shock to see, and it serves only to reinforce Milwaukee's confidence in its own efforts, says Boeder.

"A lot of communities look at forestry as the icing on a cake," he says, pride evident in his voice. "We think of ourselves as the cake." Z

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Flora in the city: Many downtown plantings are funded by a street enhancement grant program from the state Department of Transportation and are maintained by a local "business improvement district." City of Milwaukee foresters provided their professional expertise in the planning stages.